Phytochemistry, 1972, Vol. 11, pp. 1195 to 1198. Pergamon Press. Printed in England.

BOOK REVIEWS

Photobiology of Microorganisms: edited by PER HALLDAL. Wiley–Interscience, London, 1970. 479 pp. £7.

THE ANALYSIS of the components of photosynthesis and our present understanding, albeit tentative and incomplete, of its mechanism owes much to the employment of photosynthetic microorganisms. Since the enunciation of the unifying hypothesis of photosynthetic mechanism by van Niel over thirty years ago, both microalgae and photosynthetic bacteria have contributed to every phase of the development of photosynthetic knowledge and, incidently, have provided, perhaps, the most detailed and informative account of comparative biochemistry. It would be ungrateful to complain that other aspects of the photobiology of microbes are less understood, but it is true that knowledge of the effects of light, other than that on photosynthesis itself, are sometimes neglected in modern texts. This collection of essays, edited by Per Halldal, will go a long way to remedying this and provides a valuable, modern account of the effect of light on both procaryotic and eucaryotic microorganisms.

The volume opens with a description by Duysens of the physical principles underlying the adsorption of light energy and the transfer of consequent electronic excitation. Using, where possible, biological examples, this chapter both discusses thermodynamic considerations as well as action spectra and quantum yield. The two succeeding chapters describe in detail the photosynthetic apparatus of microalgae (Halldal) and of photosynthetic bacteria (Sybesma) and provide an account of the chemistry and morphology of light reception. Only two electron micrographs are used to illustrate this topic, and especially considering the range of potential readers, this deficiency of illustration is one of the few weaknesses in the volume. The photoassimilation of organic nutrients by both procaryotes and eucaryotes is documented by Weissner who also describes the less generally studied effect of light on ion fluxes in microalgae. The large group of experimentalists who use a simple, polychromatic light source will appreciate the description (Kowallik) of the marked changes in metabolism induced in unicellular green algae by blue light and it is likely that the further application of monochromatic light will challenge more of our knowledge of the photosynthetic microbial metabolism.

The group of reviews devoted to the photobiology of intact organisms starts with a study (Lorenzen) of synchronous cultures of microalgae which includes the procedures used in inducing synchrony and a description of macromolecular changes and enzyme synthesis during the cell cycle. In articles dealing with photomotion of microorganisms, Nultsch describes the interaction of phototaxis with photosynthesis in procaryotes whilst Hand and Davenport devote themselves to phototaxis and photokinesis in flagellated eucaryotes. The latter article is valuable in having some detailed descriptions of the apparatus necessary for the observation of light-controlled microbial movement. English speaking readers, in particular, will appreciate the extensive coverage by Nultsch of the important German literature in this field. Light-orientated chloroplast movements (Haupt and Schönbohm) extends the coverage of light induced movement to the filamentous alga *Mougeotia*. The complex and often beautiful movements described in these three chapters indicate the

active involvement of physics, chemistry and biology and, as in the past, this fusion of disciplines should yield exciting results.

The complex photoresponses of fungi, covering the phototropism of spores, morphogenetic effects of light and the biochemistry of pigment variation are discussed by Carlile who also describes some light induced changes in yeasts and cellular slime molds. Photoperiodic effects in algae (Dring) and the photobiology of the circadian rhythms of several groups of eucaryotes (Ehret and Will) bring together considerable information. The last chapter on bioluminescence by Airth and co-workers reverts to the description of a slightly less complex phenomena but has the virtue of adopting a comparative approach to a subject often considered from a purely biochemical viewpoint.

A wealth of stimulating and demanding detail has been assembled in this volume, which is well produced with only a few typographical errors. There are one or two omissions in subjects covered, perhaps an ecological view of photosynthetic microorganisms being the most obvious. The interdisciplinary approach has been successful and the volume should succeed as an advanced text for students and as a guide to research workers.

University of Liverpool N. G. CARR

Chemotaxonomy of the Leguminosae: edited by J. B. HARBORNE, D. BOULTER and B. L. TURNER. Academic Press, London, 1971. xv + 612 pp. £10.50.

THIS volume covers in a reasonably comprehensive fashion what is known about the distribution of most classes of chemical compounds in the Leguminosae. These include lipids, terpenes, amino acids, alkaloids, sugars including polysaccharides, flavonoids and six chapters on proteins and enzymes including the phytohaemagglutinins. The legumes constitute one of the largest plant taxa and many are useful economic plants. It is not surprising, therefore, to find that a great deal of information exists about their chemical composition. However, much of this is scattered and incomplete and whereas some individual species like *Phaseolus vulgaris* have been examined extensively, certain tribes such as Ingeae have been more or less neglected. The Editors and Authors are thus to be congratulated on their presentation, for in each case it must have been a long task to assemble all the information and make a coherent story. Nevertheless it should be stressed that this hardly makes for a taxonomy of the Leguminosae. It is true that there are areas like the non-protein amino acids where the chemical information has been put to good taxonomic use, but in the majority of cases we are faced with a list of occurrences which seem to give as many exceptions as they do regularities. Obviously, we have a really long way to go before we can hope to use chemistry fully in systematic studies, but this volume at least can point one in the right direction. It is, expectably, well produced and with the mine of information it contains is a necessity on the bookshelf of any interested in natural products and their distribution.

T.S.